105 SOUTH MONTGOMERY STREET PARKING LOT PROJECT

GENERAL PROVISIONS

1. GENERAL REQUIREMENTS

Work under this Contract shall be performed in accordance with the City of San Jose Department of Public Works Standard Specifications and Standard Details, July 1992, and Addenda, as specified in the Special Provisions herein, and as shown on the Plans.

The Standard Specifications and Standard Details are available at http://www.sanjoseca.gov/publicWorks/Details_Specs/, and can also be purchased in book form from the Public Works staff on the first floor of City Hall, telephone (408) 535-7802.

2. SCOPE OF WORK

Attention is directed to Section 4, "Scope of Work", of the City Standard Specifications, the Drawings and the following:

WORK INCLUDED

A. Prepare subgrade for aggregate base

B. Furnish and place aggregate base

C. Furnish and place asphalt concrete paving

D. Furnish and apply traffic striping and pavement markings

E. Furnish and install precast concrete wheel stops and precast concrete curb

F. Furnish and install disabled persons signs at disabled person parking stalls

G. Disconnect, remove and haul existing service entrance equipment, including its wood enclosure, service disconnect switch and all associated wires, conduits, receptacles presently connected to the load side of the service equipment.

H. Excavation and backfill of electrical trench.

I. Furnish, install, test and place in operation a complete parking lighting system consisting of but not necessarily limited to, service equipment, lighting poles, lighting fixtures, wiring, raceway and their related supports and mounting hardware.

J. Furnish, install, test and place in operation a new power supply for the existing Sign (Dancing Pig). Contractor shall determine by testing the power requirements for the said Sign prior to power supply installation and/or energization.

K. Furnish, install, test and place in operation a complete grounding system consisting of but not necessarily limited to, ground rods, bare copper wiring, and their related terminations.

L. Furnish and install grounding for the existing Sign (Dancing Pig) steel support pole.

M. Furnish and install barrier posts (bollards) for new service equipment protection.

N. Coordinate with PG&E on the supply and installation of the new service equipment, with new revenue meter, sockets, and distribution panel rated at 100A, 120/240V, 1 phase, 3 wires, termination of the new service drop and installation of barrier posts.

O. Furnish and construct vegetated bioswale, including imported topsoil

BID ALTERNATE WORK:

A. Furnish and install three (3) solar powered SHELBY Multi-Pay Payment Stations by Digital Payment Technologies. www.digitalpayment.com/shelby.html 888.687.6822. Or Owner approved equal. The units shall incorporate the following:

a. Payment Options: Coins, Bills, Credit Cards, Smart Cards, Value Cards
b. Note Stacker: 600 or 1000 bill capacity
c. Coin Changer: Self-replenishing
d. Printer: 2” or 3” receipt widths
e. Display: 320 x 240 resolution-color or monochrome LCD screen
f. Power: Integrated solar panel (20 W)
g. Operation Modes: Pay-and-Display and/or Pay-by-Space
h. Multi-lingual Option: Up to 4 languages using roman or non-roman characters
i. Standards: PCI Compliant, UL/CSA Approved, ADA Compliant
j. Pad Size: 2' x 2' x 2' would bolt pattern of 10" x 7" aligned with screen towards the parking lot. Consult supplier for optimum pad sizing, bolt sizing and orientation.

WORK NOT INCLUDED

A. Clearing of site

B. Rough grading

C. Self-pay boxes

D. Disconnection and removal of the existing 480Y/277V, 3 phase, 4 wire service drop/service entrance conductors originating from the existing PG&E pole at S. Montgomery Street.

E. Disconnection and removal of the existing 120/240V, 1 phase, 3 wire service drop/service entrance conductors originating from the existing pole mounted PG&E transformer at Otterson Street.

F. Removal of the existing PG&E revenue meter.

G. Supply and installation of the new 120/240V, 1 phase, 3 wire service drop from the existing PG&E pole at Otterson Street.

H. Supply and installation of new revenue meter.

3. DRAWINGS

Drawing No.	Rev.	Title
C-1		Grading, Paving and Drainage Plan
C-2		Striping Plan
E-1		Parking Lighting - Plan
E-2		Electrical Miscellaneous Details
Drawing No.	Rev.	Title
E-3		Single Line Diagram
E-4		New and Existing Service Drops-Plan
E-5		Electrical Details
L-1		Irrigation Plan
L-1		Irrigation Details
L-1		Planting Plan
L-1		Planting Details

SPECIAL PROVISIONS

1. SUBGRADE PREPARATION

Subgrade preparation shall conform to the provisions of Section 21, "Subgrade Preparation", and Section 26, "Aggregate Bases", of the City Standard Specifications, and these Special Provisions. Relative compaction shall be not less than 95% for a depth of 0.5 foot at optimum moisture content.

2. AGGREGATE BASE

Aggregate base shall be Class 2, 1-inch maximum sieve size, conforming to the requirements of Section 26, "Aggregate Bases", of the City Standard Specifications.

3. ASPHALT CONCRETE PAVING

Asphalt concrete paving shall conform to the provisions of Section 39, “Asphalt Concrete”, of the City Standard Specifications and these Special Provisions.

Asphalt concrete shall be Type A, 3/4 inch Maximum, Medium Gradation.

Asphalt concrete shall use AR-4000 viscosity graded asphalt.

Asphalt concrete shall not be supplied from more than one mixing plant unless otherwise approved by the Engineer.

The Contractor shall furnish to the Engineer, at least 10 working days prior to the start of work, a list of his sources of materials together with a Certificate of Compliance, indicating that materials to be incorporated in the work fulfill the requirements of these specifications, and a Mix Design for the asphalt concrete. The Certification of Compliance shall be signed by the material supplier or supplier’s representative. Materials to be incorporated in the work shall meet the requirements of these specifications after incorporation in the paved areas shown on the Plans. The Contractor shall be responsible for all costs associated with the Mix Design.

If not prepared specifically for this project, the Mix Design shall have been prepared within the last 6 months.

The Engineer reserves the right to obtain samples at the point of delivery and/or at the point of manufacture.

During paving operations, the Owner may perform various field and plant tests for compliance with the approved mix. If it is found that the asphalt concrete mix being used does not comply with the approved mix, the paving operations shall cease until the plant supplying the asphalt concrete makes necessary corrections to bring the mix back into compliance. Any materials rejected by the Owner shall

be removed from the job site, at the Contractor's expense, and no additional payment will be allowed.

The Contractor shall notify the Engineer at least 72 hours in advance of commencement of paving operations.

The Contractor shall furnish and use tarpaulins to cover the first loads in the morning and subsequent loads until the ambient air temperature is above 55 degrees F.

The Contractor shall place material that is not less than 300°F while in the paver's hopper.

The Contractor shall pave in such a way as to minimize longitudinal cold joints. In no event shall longitudinal joints be allowed to remain at the end of the working day.

Spreading, shoveling or raking asphalt concrete shall not leave irregular or segregated areas. The Contractor shall supply an appropriate number of qualified, experienced rakers and shovelers.

Asphalt concrete shall be compacted to a relative compaction of not less than 98 percent and shall be finished to the lines, grades and cross sections shown on the Plans. In-place density of asphalt concrete shall be determined prior to opening the pavement to public traffic.

The Owner may retain a testing firm to monitor in-place compaction. Density will be determined using a nuclear gage.

4. TRAFFIC STRIPES AND PAVEMENT MARKINGS

Traffic stripes and pavement markings shall conform to the provisions in Sections 84-1, "General," and 84-3, "Painted Traffic Stripes and Pavement Markings," of the City Standard Specifications and as shown on the Plans and these Special Provisions.

Disabled persons parking symbol and parking stall dimensions shall conform to Caltrans Standard Plans A24C and A90A.

5. PRECAST CONCRETE

The work includes furnishing and installing precast concrete parking wheel stops and precast concrete curbs, including dowels and epoxy cement adhesive.

Precast parking wheel stops shall be as indicated on the plans. Precast curbs shall be Type A1-B3 as shown on City Standard Detail R-1. Epoxy shall conform to 95-2.04 Rapid Set Epoxy Adhesive or 95-2.05 Standard Set Epoxy Adhesive conforming to Section 95, "Epoxy", of the City Standard Specifications.

6. DISABLED PERSONS PARKING SIGNS

Disabled persons parking signs shall be ISA Parking Sign R99 on galvanized steel posts at each parking stall, and one R100B sign adjacent to disabled persons stalls on galvanized steel post, conforming to Caltrans Standard Plan A90A.

7. ELECTRICAL SYSTEM

Electrical system materials, installation and testing shall conform to NFPA 70 (The National Electrical Code) and to the applicable provisions and guides in Section 86, "Signals, Lighting and Electrical Systems" of the City Standard Specifications, the City Standard Details, the Plans, and these Special Provisions.

Underground conduits shall be rigid nonmetallic PVC, Type DB 120 for direct burial applications. No portion of DB 120 conduits shall be exposed. Conduits risers from underground shall be PVC, Schedule 80. Installations shall be as specified in the City Standard Specifications.

Bonding and Grounding – Each pole, including the existing Sign steel support pole, shall be grounded by means of individual ground rod.

Field Tests – Field tests shall conform to the provisions of Section 86-2.14, "Field Tests," of the City Standard Specifications and these Special Provisions.

All tests shall be performed in the presence of the Engineer.

Field painting shall be as required for the existing Sign steel support pole.

8. VEGETATED BIOSWALE

Vegetated bioswale materials and construction shall conform to the provisions in the Plans, Section 02810 “Irrigation” and Section 02900 “Planting” of the Special Provisions and Section 20, "Landscaping", of the City Standard Specifications.

Imported topsoil materials shall meet requirements in Section 02900-2.7 & 3.1 and Section 20-2, "Soil", of the City Standard Specifications. Plants shall be as specified on the Plans.

Apply fertilizer to planted areas as specified in Section 02900-3.8 and Section 20 of the City Standard Specifications.

Perform maintenance work on planted areas for a period of 4 months from acceptance of planting by the Agency as specified in Section 02900-3.8and Section 20-7, "Maintenance", of the City Standard Specifications.

TECHNICAL SPECIFICATIONS – LANDSCAPING

DIVISION 2 SITE WORK

02810 IRRIGATION
02900 PLANTING

SECTION 02810

IRRIGATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. The work in this section consists of furnishing, layout and installing an irrigation system.

B. Related work specified elsewhere includes:

1. Section 02900, PLANTING.

1.2 QUALITY ASSURANCE

A. Manufacturer's Specifications: Follow manufacturer's current printed specifications and drawings in all cases where the manufacturers of articles used in the Contract furnish directions covering points not specified or shown in the drawings.

B. Ordinances and Regulations: All local, municipal and state laws, codes and regulations governing or relating to all portions of this work are hereby incorporated into and made a part of these Specifications. Anything contained in these Specifications shall not be construed to conflict with any of the above codes, regulations or requirements of the same. However, when these Specifications and Drawings call for or describe materials, workmanship or construction of a better quality, higher standard, or larger size than is required by the above codes and regulations, the provisions of these Specifications and Drawings shall take precedence. Furnish without extra charge additional materials and labor required to comply with above rules and regulations.

C. References, Codes and Standards:

1. AB 325 State of California Model Water Efficient Landscape Ordinance.
2. Water Use Classification of Landscape Species (WUCOLS).
3. American Society of Irrigation Consultants (ASIC) Design Guidelines.
4. California Landscape Standards, California Landscape Contractors Association, Sacramento, California.
5. CAL-OSHA, title 8, Subchapter 4-Construction Safety Orders and Subchapter 7-General Industry Safety Orders.
6. California Electric Code.

7. California Plumbing Code (UPC) published by the Association of Western Plumbing Officials.
8. NFPA 24, Section 10.4, Depth of Cover.
9. Underwriters Laboratories (UL): Electrical wiring, controls, motors and devices, UL listed and so labeled.
10. American Society of Testing Materials (ASTM).

D. Furnish without extra charge any additional material and labor when required by the compliance with all above mentioned codes and regulations, though the work be not mentioned in these specifications or shown on the drawings.

E. Reclaimed Water: Contact water company supplying reclaimed water prior to the commencement of installing the irrigation system to coordinate inspection of the work and to verify all codes and regulations regarding use of reclaimed water. Provide all required signage and other warnings.

F. Experience: Assign a full-time employee to the job as supervisor for the duration of the Contract with a certified landscape technician, irrigation certification through CLCA or minimum of four (4) years experience in landscape irrigation installation.

G. Labor Force: Provide a landscape installation and maintenance force thoroughly familiar with, and trained in, the work to be accomplished to perform the task in a competent, efficient manner acceptable to the Owner's Representative.

H. Explanation of Drawings:

1. Due to the scale of the Drawings, it is not possible to indicate all offsets, fittings, sleeves, etc., which may be required. Carefully investigate the conditions affected all of the work and plan accordingly, and furnish all required fittings. Install system in such a manner to avoid conflicts with planting, utilities and architectural features.
2. Do not install the irrigation system as shown on the Drawings when it is obvious in the field that obstructions, grade differences or discrepancies in arc dimensions exist that might not have been considered in engineering. Bring such obstruction or differences to the attention of the Owner's Representative. In the event this notification is not given, the Contractor shall assume full responsibility for any revision necessary.

1.3 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

A. The Drawings show, if applicable, existing above and below grade structures and utilities that are known to the Owner. Locate known existing installations before proceeding with construction operations that may cause damage to such installations. Existing installations shall be kept in service where possible and damage to them shall be repaired with no adjustment of Contract Sum. Verify with Owner if As Built drawings are available.

B. If other structures or utilities are encountered, request Owner's Representative to provide direction on how to proceed with the Work. If a structure or utility is damaged, take appropriate action to ensure the safety of persons and property.

C. Verify location of existing irrigation systems to be removed and replaced. Maintain any existing systems as required by the Drawings and Specifications, including temporary retention of systems necessary to maintain existing on site and adjacent planting.

1.4 SUBMITTALS

A. Materials List:

1. Submit required copies of the cut sheets and a complete list of materials proposed for installation, along with any proposed substitutions clearly identified and obtain the Owner Representative's written approval thereof before proceeding. Use only accepted materials and items of equipment.

2. List all materials by manufacturer's name and model number.

B. Substitutions:

1. If the Contractor desires to substitute a product, he shall list each item and note it as a "substitution" and provide the following information:
    a. Descriptive information describing its similarities to the specified product.

2. If the product is approved and, in the opinion of the Owner's Representative, the substituted product does not perform as well as the specified product, the Contractor shall replace it with the specified product at no additional cost to the Owner.

C. Manuals:

1. Prior to the final acceptance of the irrigation system, furnish three (3) individually bound Operation and Maintenance Manuals to the Owner's Representative for use by the Owner. The manuals shall contain complete enlarged drawings, diagrams and spare parts lists of all equipment installed showing manufacturer's name and address. In addition, each Service Manual shall contain the following:

    a. Index sheet indicating the Contractor's name, address and phone number.
    b. Copies of equipment warranties and certificates.
    c. List of equipment with names, addresses and telephone numbers of all local manufacturer representatives.
    d. Complete operating and maintenance instructions in sufficient detail to permit operating personnel to understand, operate and maintain all equipment.
    e. Parts list of all equipment such as controllers, valves, solenoids and heads.

D. Record Drawings:

1. Dimension the location of the following items from two (2) permanent points of reference such as building corners, sidewalks, road intersections, etc.:

    a. Connection to existing water lines/meter.
    b. Connection to electrical power.
    c. Gate valves.
    d. Routing of irrigation pressure lines (a dimension at least every 100 feet and as required to identify all changes in direction and location).
    e. Remote control valves.
    f. Routing of control valves.
    g. Quick coupling valves.
    h. All sleeve locations.
    i. Routing of all control wiring.
    j. Include all invert elevations below 12".

2. Deliver a reproducible record drawing to the Architect within seven (7) working days before the date of final review. Delivery of the record drawings shall not relieve the Contractor of the responsibility of furnishing required information in the future.

E. Controller Plan:

1. Provide one Irrigation Diagram plan in each controller housing. The plan shall show the area controlled by each valve in different colors and for orientation, any major permanent structure such as buildings and roads.
2. Charts to be waterproof and hermetically sealed between two pieces of transparent 10 mil thick plastic and installed in each controller on the door as accepted by the Owner's Representative no later than the time of the coverage test of the irrigation system.

F. Maintenance Material - supply the following tools to the Owner:

1. Three (3) sets of specialized tools required for removing, disassembling and adjusting each type of irrigation, valve or other equipment supplied on this project.
2. Two (2) keys for each type of equipment enclosure.
3. Two (2) keys for each type of automatic controller.
4. Two (2) quick-coupler keys and matching hose swivels for each type of quick-coupling valve installed.
5. All lock keys shall be keyed alike.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Furnish and deliver materials in manufacturer's packaging, bearing original legible labeling.

B. The Contractor is cautioned to exercise care in handling, loading, unloading, and storing PVC pipe and fittings. All PVC pipe shall be transported in a vehicle which

allows the length of the pipe to lie flat so as not to subject it to undue bending or concentrated external load at any point. Any section of pipe that has been dented, cracked, or otherwise damaged shall be discarded and, if installed, shall be replaced with new piping.

1.6 SEQUENCING AND SCHEDULING

A. Acceptance: Do not install main line trenching prior to acceptance by Owner's Representative of rough grades completed under another Section.

B. Coordination: Coordinate with the work of other sections to insure the following sequence of events:

1. Sleeves and Conduits: Installation of all sleeves and conduits to be located under paving and through walls prior to placement of those materials.

2. Install piping prior to soil preparation (planting soil amendment installation).

1.7 WARRANTY

A. In addition to manufacturer's guarantees and warranties, work shall be warranted for one (1) year from date of final acceptance against defects in material, equipment and workmanship. Warranty shall also cover repair of damage to any part of the premises resulting from leaks or other defects in materials, equipment and workmanship to the satisfaction of the Owner.

B. Include a copy of the warranty form in the Operation and Maintenance Manual.

1.8 OPERATION

A. Routine: Inspect and adjust all spray heads and control valves including raising or lowering of spray head heights to accommodate plant growth and weather conditions.

B. Controller: Inspect regularly for power interruption and reset clock as required. Adjust station timing to accommodate changes in plant growth and weather conditions.

C. System Failure: Perform all repairs within one (1) operating period. Replacements to match removed products and materials in all respects. Report promptly all damage not resulting from Contractor's operations. Repair all damage caused by Contractor at no expense to Owner.

D. Climate Change: Set and program automatic controllers in response to seasonal requirements and requirements of newly planted materials.

PART 2 - PRODUCTS

2.1 PIPE

A. Pressure Main Line Pipe and Fittings: All PVC fittings shall bear the manufacturer's trademark name, material designation, size, applicable I.P.S. schedule and NSF seal of approval.

B. All main line pipe shall be solvent welded and shall be schedule 40 unless shown otherwise on the Drawings.

1. PVC Pressure Rated Pipe: ASTM D2241 NSF approved Type I, Grade I, solvent welded PVC with an appropriate standard dimension ratio (S.D.R.).
2. PVC Scheduled Pipe: ASTM D1785 NSF approved, Type I,
3. Grade I, solvent welded PVC.
4. PVC Solvent-weld Fittings: ASTM D2466 Schedule 40, 1-2, II-I NSF approved.
5. Connections between Main Lines and RCVs: Schedule 80 PVC, threaded one end only (TOE) nipples and fittings
6. Valves 2-inch and larger shall be flanged only. Valves 2-inch and larger shall have threaded schedule 80 nipples into valve body with PVC slip-couplings to the mainline."
7. Connections between Main Lines and RCVs: Schedule 80 PVC (threaded both ends) nipples and fittings unless required otherwise by local jurisdiction.
8. Valves 2-inch and larger shall be flanged only.

9. Copper pipe shall be Type K or Red Brass where threaded joints are required and Type L otherwise.

C. All lateral line pipe shall be solvent welded and shall be schedule 40 unless shown otherwise on the Drawings.

2.2 CONTROLLER ENCLOSURES

A. Type: Use one of the following (unless noted otherwise on the Drawings):

1. Stainless steel, NEMA Type 3 rated, with back panel, padlocking hasp and padlock. See Detail for pedestal construction.
2. Le Meur, (714) 822-5100.
3. "Strong Box" available from John Deere, (800) 347-4272.

2.3 REMOTE CONTROL VALVE: As shown on Drawings and with the following minimum requirements:

A. Remote control valves shall be those normally manufactured for irrigation systems and shall have a slow, consistent speed of closure through entire closing operation, including last portion. To ensure this, the effective diaphragm working area/valve seating opening ratio must be a minimum 3 to 1.

B. Shall be mechanically self-cleaning to help prevent diaphragm or solenoid port plugging. To ensure this, the flush rod should be tapered to vary the size of the port opening as the diaphragm raises and lowers, thus allowing trapped material to escape. Rod is to be finished with a serrated surface to help scrub trapped material out. Screens not acceptable.

C. Shall have removable valve seat so valve can be repaired without removal from irrigation line.

D. Shall have ability to operate manually without the use of wrenches or special keys.

E. Shall have one-piece solenoid that attaches directly to valve without shunts or clips that can be lost.

F. Shall have cross top handle to adjust maximum travel of diaphragm to allow "tuning" of valve and closure.

2.4 BOX FOR REMOTE CONTROL VALVE: Rectangular plastic valve box with lid - Ametek, Brooks, Christy or accepted equal in green color (unless noted otherwise), with non-hinged bolt down lid marked “irrigation”. Box body shall have knock outs. Do not saw cut body. Minimum size box as shown on Drawings. Increase box size as required to fit. Valve box lids are to indicate the controller letter and station number of valve as accepted by Owner’s Representative. Also refer herein to required polyurethane tag at valve solenoid control wire under Control Wires. Locate the identification in center of the lid. Provide separate box for each valve. Provide H/20 Loading concrete boxes with bolt-down concrete lids for all valves that occur in paved areas.

2.5 CONTROLLER GROUND

A. Provide each pedestal controller with its own ground rod. Separate the ground rods by a minimum of eight feet. The ground rod shall be an eight foot long by 5/8" diameter U.L. approved copper clad rod or as recommended by controller manufacturer. Install no more than 6" of the ground rod above finish grade. Connect #8 gauge wire with a U.L. approved ground rod clamp to rod and back to ground screw at base of controller with appropriate connector. Make this wire as short as possible, avoiding any kinks or bending. Install within pedestal housing base unless otherwise noted.

B. Provide each irrigation controller with its own independent low voltage common ground wire.

2.6 CONTROLLER(S): As shown on Drawings and with the following minimum requirements:

A. Shall be user-friendly. The controller must have a minimum 20-character readout display describing actions or options, or a full visible panel of buttons, dials, or switches that control all different functions separately.

B. Shall have the ability to start a programmed sequence of valves a minimum of 5 times a day per program.

C. Shall have ability to easily and quickly change watering schedules due to change in weather.

2.7 CONTROL WIRES

A. Connections between automatic controllers and the solenoid-operated electric control valves shall be made with direct burial copper wire 14- AWG-UF 600 volt (minimum size). Pilot wires shall be a color other than white, and shall be a different color for each automatic controller with wires sharing a common trench. Common wires shall be white in color, with a different color stripe for each controller with wiring sharing the same common trench. No stripe is required if multiple controller wiring is not present.

B. Size of wire shall conform to the remote control valve manufacturer's specification for control wire sizes, but in no case shall the control wire be smaller than #14. Runs over 2,000 lineal feet shall be #12- AWG-UF 600 volt copper wire.

C. All wire splices are to be made within a valve box, with a copper crimp-type connector, and a "3-M" #DBY splice kit.

D. Use continuous control wiring between controllers and remote control valves (no splices).

E. Provide polyurethane tag at valve solenoid control wire that shows the controller number and station number. Also refer to valve box lid identification.

F. Provide a spare control wire in each RCV box for future.

2.8 SPRAY HEADS

A. Pop-up as shown on drawings and with the following minimum requirements:.

B. Shall have approximately 30 psi water pressure coming out of nozzle to prevent "fogging" or misting. Shall have pressure-compensating devices.

C. Shall have ability to prevent low head drainage. Use heads with integral check valves.

D. Shall not have spray blocked by shrubbery; use minimum 4" pop-ups in turf areas.

2.9 QUICK COUPLER VALVES:

A. Quick coupler valves shall be as listed on the Drawings with 10" diameter box and lid similar to isolation valve box described below.

2.10 ISOLATION VALVE:

A. Valves 3 inches and smaller: 125 lb. WSP bronze gate valve with union bonnet, non-rising stem and solid wedge disc. Valves shall be line size.

2.11 BOX FOR ISOLATION VALVE: 10" diameter plastic, Ametek, Brooks, Christy with bolt down lid marked "irrigation," or accepted equal. Avoid locating valve in paved areas. Provide H/20 Loading concrete box with bolt-down concrete lid if valve is located in paved area. Obtain location approval by Owner's Representative.

2.12 SWING JOINTS

A. Irrigation Spray Heads: Use Dura, Lasco or equal pre-assembled swing joints with O-rings.

B. Quick Coupling Valve: Dura 1-inch 1-A2-1-11-18 pre-assembled swing joint with O-rings and Dura quick lock to receive stabilizing rod.

2.13 BACKFLOW PREVENTION DEVICE

A. As required by Code and as shown on Drawings. Verify with Owner if Anti-freeze Jacket is required and provide as required.

B. Riser assemblies from main line burial depth to backflow preventers shall be Schedule 40 brass pipe.

C. All metallic pipe and fittings installed below grade shall be painted with two coats of Koppers #50 Bitumastic, or approved equal. Pipes may be wrapped with an approved asphaltic tape in lieu of the liquid-applied coating.

2.14 BACKFLOW PREVENTION DEVICE ENCLOSURE

A. “Smooth Touch” enclosure without sharp edges, by Strong Box, available from V.I.T., Escondido, CA (800) 729-1314 or equal. Coordinate size of enclosure with plumbing for minimum clearance and size. Enclosure to include hasp and staple to receive padlock. Padlock N.I.C.

2.15 Y-STRAINER

A. “Y”-Strainer upstream of remote control valves, Brass, 150 mesh.

2.16 RCV IDENTIFICATION TAGS: Plastic or brass tags with valve number, approximately 2” by 2” with number imprinted, as accepted by Owner.

2.17 MISCELLANEOUS INSTALLATION MATERIALS

A. Solvent Cement and Primers for Solvent-weld Joints: Make and type approved by manufacturer(s) of pipe and fittings. Maintain cement proper consistency throughout use.

B. Pipe and Joint Compound: Permatex: Do not use on irrigation inlet port.

2.18 MISCELLANEOUS EQUIPMENT/ACCESSORIES

A. Concrete for Thrust Blocks and Pads: Poured-in-place Class A concrete per Section 90 of the Caltrans Standard Specificaitons.

B. Sleeves and Conduits: See Drawings.

C. Key(s) for Quick-Coupling Valves:

1. Type: Same manufacturer as Quick-Coupling Valve.

2.19 OTHER EQUIPMENT: As shown on Drawings and required for a fully functional irrigation system.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Sleeves and Conduits: Verify that all installed sleeving and conduits are undisturbed and are free of defects or errors introduced by the work of other sections.

B. Water Meter/Water Pressure: Test and verify that existing water pressure is the minimum pressure at maximum system g.p.m. to operate the irrigation system as indicated on the drawings.

C. Stub-outs: Verify that all stub-outs to be provided under another contract are correctly sized, located and installed as noted on Drawings.

D. Notification: Submit written notification to Owner's Representative within ten (10) working days of above inspections describing all acceptable and non-acceptable site conditions.

3.2 CONNECTIONS TO SERVICES

A. Provide and coordinate connection to water meter.

B. Provide and coordinate connection of irrigation controller to electrical power source.

3.3 INSTALLATION

A. Install irrigation system components in accordance with this Section, with the Drawings, with the manufacturer’s recommendations, and with established industry standards. The Contractor shall do nothing that may jeopardize any manufacturer warranty.

B. Conduits and Sleeves:

1. Coordination: Provide conduits and sleeves and coordinate installation with other trades.

2. Extent: Install conduits and sleeves where control wires and pipes pass under paving or through walls as shown on Drawings. Extend twelve inches (12") beyond edges of paving and walls and cap ends until ready for use.

C. Excavating and Trenching:

1. Dig trenches wide enough to allow a minimum of three inches (3") between parallel pipe lines. Provide a minimum cover from finish grade as follows:

   a. 24-inches Deep: Over pipe on pressure side of irrigation control valve, control wires and quick-coupling valves.
   b. 36-inches Deep: Over all pipe and pipe sleeves under roadways, parking lots, entrance to parking lots and Fire-Access Lanes per NFPA 24, Section 10.4.4.
   c. 18-inches Deep: Over pipe on non-pressure side of irrigation control valve.
   d. Direct Burial PVC Piping Under Pavement: Provide a minimum of 4 inches of sand backfill on all sides and 24 inches cover to bottom of paving.

D. Pipeline Assembly:

1. Install pipe and fittings in accordance with manufacturer's current printed Specifications.
2. Clean all pipes and fittings of dirt, scale and moisture before assembly.
3. Solvent-welded Joints for PVC Pipes:

   a. Solvents: Use solvents and methods specified by pipe manufacturer.
   b. Curing Period: Minimum of one (1) hour before applying any external stress on the piping and at least 24 hours before placing the joint under water pressure.

4. Threaded Joints for Plastic Pipes:
   a. Use Permatex on all threaded PVC fittings except irrigation heads and quick coupler valve ACME threads.
   b. Joining: Use strap-type friction wrench only. Do not use metal-jawed wrench. Assemble finger tight plus one or two turns.

5. Laying of Pipe:

   a. Bedding On-grade: Remove from trench all rocks or clods. Bed pipe in atleast2 inches of soil excavated from trench. Backfill on all sides of piping to provide a uniform bearing.
   b. Snaking: Snake pipe from side to side of trench bottom to allow for expansion and contraction. Minimum allowance for snaking is one (1) additional foot per 100 ft. of pipe.
   c. Moisture Restrictions: Do not lay PVC pipe when there is water in the trench. Do not assemble PVC pipe unless the pipe is dry.

E. Control Valves:

1. Install in valve boxes where shown on Drawings and group together where practical. Install box flush with finish grade, not necessarily level. If valve occurs in drainage swale, relocate out of drainage swale as approved by Owner's Representative.
2. Where two or more valves are installed adjacent to each other, provide at least six inches (6") separation. Align boxes in a row, perpendicular with pavement edge.
3. Permanently mark valve box lid with 2" black valve number and controller letter or with numbered metal tag inside box as approved by Owner's Representative.
4. Refer to control wiring for required spare wire in each valve box.
5. Install “Y”-Strainer upstream of remote control valves at backflow preventer.

F. Irrigation Head Installation:

1. Pop-up Heads:
    a. Place all irrigation heads in planting areas with top of heads set to finish grade or top of mulch as required.
    b. Place part-circle pop-up irrigation heads two inches (2") from edge of and flush with top of adjacent walks, header boards, curbs and mowing bands or paved areas and 12 inches (12") from building foundations at time of installation.
    c. Set all irrigation heads in turf to allow for settlement. Adjust as required after settlement. Hold heads two inches (2") clear of pavement edge.

G. Automatic Controller:

1. General: Install with lock box cutoff switch per local code and manufacturer's current printed specifications.
2. Connection to Valves: Connect remote control valves to controller in clockwise sequence to correspond with station setting beginning with Stations 1, 2, 3, etc.
3. Labeling: Affix controller letter (i.e., "A") on inside of controller cabinet door with minimum of one-inch (1") high permanent letter.
4. Irrigation Diagram: Affix a non-fading, waterproof copy of irrigation diagram to cabinet door below controller name. Irrigation diagram to be sealed between two plastic sheets, 20 mil. minimum thickness. Use a legible reduced copy of the Record Drawing for the irrigation diagram clearly showing all valves operated by the controller, station, number, valve size, and type of planting irrigated. Color code area operated by each valve.

H. Control Wiring:

1. General: Install control wires in common trenches with irrigation mains and laterals wherever possible. Lay to the bottom side of pipe line. Provide looped slack at valves. Snake wires in trench to allow for contraction of wires. Tie wires in bundles at 10 ft. intervals.
2. Extra Length: Provide 30 inches (30”) extra control wire at each remote control valve splice to facilitate the removal of the remote control bonnet to finish grade without cutting wires.

3. Spare: Install one unconnected spare control wire running from the controller through each intermediate control valve box.
4. Size: Minimum size of wire is to be determined strictly by the manufacturer's current printed specifications for remote control valves, but not smaller than #14.
5. Detection Wire: Install a bare #12 copper wire or greater on top of the PVC supply line for the purpose of possible future mine detection search. Install the control wires on the bottom of the PVC supply line with electrical tape every ten feet (10').
6. Splicing: Crimp control wire splices at remote control valves. Seal with specified splicing materials. In-line splices will be allowed only on runs exceeding 2500 feet and only in junction boxes.

I. Closing of Pipe and Flushing of Lines:

1. Capping: Cap or plug all openings as soon as lines have been installed to prevent entrance of materials that would obstruct the pipe. Leave in place until removal is necessary for completion of installation.

J. Rain Shutoff Switch:

2. Install switch in area not affected by irrigation or rain shadow. Provide wires in rigid conduit as accepted by Owner's Representative.

K. Detection Wire and Warning Tape:

1. Install a bare # 12 copper wire or greater on top of the PVC supply line for the purpose of possible future mine detection search.
2. Install a continuous PVC irrigation mainline warning tape 12" above the supply line.

L. RCV IDENTIFICATION TAGS: Install in remote control valve box as recommended by manufacturer and as accepted by Owner's Representative.

3.4 MISCELLANEOUS EQUIPMENT

A. Install miscellaneous equipment with concrete footings, brackets, etc., as required and as recommended by manufacturer.

3.5 FIELD QUALITY CONTROL

A. Testing of Irrigation System:

1. Make hydrostatic tests with risers capped when welded PVC joints have cured at least 24 hours. Center load piping with backfill to prevent pipe from moving under pressure. Keep all couplings and fittings exposed.
2. Install two (2) pressure gauges at opposite ends of main line system. Pump system up to a minimum of 125 psi the day preceding the scheduled test and verify that pressure is holding. Inspect system early following day and immediately notify Owner's Representative if the test confirmation must be postponed.

3. Apply continuous static water pressure of 125 psi in accordance with Caltrans Standard Specifications Section 20-5.03H, except after a drop in pressure (5 psi maximum), then the pressure must stabilize and remain stable for a one (1) hour minimum period before acceptance of the test.
4. Leaks detected during tests shall be repaired and test repeated until system passes tests at no additional cost to Owner.

B. Adjustment of the System:

1. Flush and adjust all irrigation heads for optimum performance and to prevent overspray onto walks, roadways and buildings. Adjust the arc and radius as applicable.
2. Include as a part of the work any nozzle changes or arc adjustments necessary due to daytime windy conditions during grass establishment period. After grass has been established and watering can be performed during calm early morning or evening hours, make any required adjustments to nozzles and arcs.
3. Set all irrigation heads perpendicular to finished grades unless otherwise noted on the drawings.
4. When the landscape irrigation system is completed and before planting, perform a coverage test in the presence of the Owner's Representative to determine if the water coverage for planting areas is adequate.
5. Test controllers individually in the presence of the Owner's Representative. Demonstrate that all control valves operate electronically. Provide vehicles and radio equipment as necessary to expedite this process.
6. Demonstrate to Owner's Representative that irrigation scheduling programmed into controller is adequate for plant requirements without causing runoff, and that scheduling capacities of controller are utilized.

3.6 BACKFILL AND COMPACTING

A. General: After system is operating and required tests and reviews have been made, backfill excavations and trenches with clean soil, free of debris.

B. Backfill for All Trenches: Regardless of the type of pipe covered, compact to minimum 95% density under pavements and 85% under planted areas.

C. Finishing: Dress off areas to finish grades. Re-dress any areas which subsequently settle.

D. Owner's testing agency will test backfill compaction in areas under paving.

3.7 MAINTENANCE

A. The entire irrigation system shall be under full automatic operation for a period of 2 days prior to any planting.

B. The Owner's Representative reserves the right to waive or shorten the operation period.

C. Maintain/repair system for full duration of plant maintenance period.

3.8 REVIEWS PRIOR TO ACCEPTANCE

A. Notify the Owner's Representative in advance for the following reviews, according to the time indicated:

1. Supply line pressure test and control wire installation - 72 hours.
2. Coverage and controller test - 72 hours.
3. Final review - 7 days.

B. No reviews will commence without record drawings, without completing previously noted corrections, or without preparing the system for review.

3.9 FINAL REVIEW AND CLEANUP

A. Operate each system in its entirety for the Owner's Representative at time of final review. Any items deemed not acceptable by the Owner's Representative shall be reworked to the complete satisfaction of the Owner's Representative.

B. Provide evidence to the Owner's Representative that the Owner has received all accessories and equipment as required before final review can occur.

C. Final acceptance and start of warranty period will occur no earlier than the end of the plant maintenance period.

D. For time of final review, Contractor shall arrange a meeting with the Owner's maintenance personnel to demonstrate the operation of the irrigation systems automatically in order to verify acceptance and to familiarize the maintenance personnel with the system and recommended programming.

*** END OF SECTION ***

SECTION 02900
PLANTING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide planting work and planting maintenance complete as shown on the drawings and as specified including staking and layout of the landscaping.

B. Related work specified elsewhere includes:

1. Section 02810, IRRIGATION

1.2 QUALITY ASSURANCE

A. Reference Standards:

1. Ordinances and Regulations: All local, municipal and state laws, codes and regulations governing or relating to all portions of this work are hereby incorporated into and made a part of these Specifications. Anything contained in these Specifications shall not be construed to conflict with any of the above codes, regulations or requirements of the same. However, when these Specifications and Drawings call for or describe materials, workmanship or construction of a better quality, higher standard than is required by the above mentioned codes and regulations, the provisions of these Specifications and Drawings shall take precedence. Furnish without extra charge additional materials and labor required to comply with above rules and regulations.
2. "Sunset Western Garden Book," Lane Publishing Co., Menlo Park, California; current edition.
3. "American Standards for Nursery Stock," American Association of Nurseryman, 230 Southern Building, Washington, D.C. 20005.
4. Alameda Countywide Clean Water Program (ACCWP) or member agency having jurisdiction over the project work.
5. US Composting Council Compost analysis Program (CAP)
6. Test Methods for the Evaluation of Composting and Compost (TMECC)
7. Manufacturer's recommendations.

B. Qualifications:

1. Experience: Assign a full-time employee to the job as foreman for the duration of the Contract who is certified landscape technician, certification through CLCA or minimum of four (4) years experience in landscape installation and maintenance supervision, with experience or training in turf management, entomology, pest control, soils, fertilizers and plant identification.

2. Labor Force: Provide a landscape installation and maintenance force thoroughly familiar with, and trained in, the work to be accomplished to perform the task in a competent, efficient manner acceptable to the Owner.

C. Requirements:

1. Supervision: The foreman shall directly supervise the work force at all times and be present during the entire installation. Notify Owner's Representative of all changes in supervision.
2. Identification: Provide proper identification at all times for landscape maintenance firm's vehicles and a labor force uniformly dressed in a manner satisfactory to Owner's Representative.
3. Planting soils and organic amendments shall meet the AACWP requirement for the stormwater treatment measures used with this project work.

D. Plant Material Standards

1. Quality and Size of Plants: Conform to the State of California Grading Code of Nursery Stock, No. 1 grade. Use only nursery-grown stock which is free from insect pests and diseases.
2. Comply with federal and state laws requiring inspection for plant diseases and infestations. Submit inspection certificates required by law with each shipment of plants, and deliver certificates to the Owner. Obtain clearance from the County Agricultural Commissioner as required by law, before planting plants delivered from outside the County in which planted.

E. Testing Agency: Soil and Plant Laboratory, Inc. 352 Matthew Street (P.O. Box 153), Santa Clara, CA 95052; Tel. (408) 727-0330; or Root Zone Associates, P.O. Box 18911, San Jose, CA 95118; Tel. (408) 264-7024. Components of the test shall include all major nutrients, pH, salinity, boron, sodium, micronutrients, copper, zinc, manganese and iron, adsorption rate, organic content and texture.

1.3 SUBMITTALS

A. Product Data: Manufacturer's current catalog cuts and specifications of the following:

1. Fertilizers
2. Iron Sulfate

B. Samples:

1. Plants: Submit typical sample of each variety or entire quantity to site for approval by Owner’s Representative.
2. Organic Mulch: Submit 1-pint sample.
3. Organic (Soil) Amendment with Lab analysis.

C. Certificates of Compliance/analytical data from approved laboratory for degree of compliance for the following:
1. Organic amendment.

D. Delivery Receipts: Provide delivery receipts for quantities of organic soil amendments delivered to the site.

E. Topsoil Analysis: After approval of rough grading and topsoil placement, obtain three representative samples of topsoil taken from accepted site locations at depth of 4" to 6" below finish grade and submit to an accredited Soils Laboratory for "agricultural suitability" analysis report, including particle size, and evaluation of physical and chemical properties of soil and recommendations for adding amendments and fertilizers to the soil.

F. Subsoil Analysis: Besides the above required soil samples, take one representative sample of any subgrade soil that is to receive a layer of imported planting soil over it. The laboratory report shall include the subgrade soil's total combined silt and clay content for determining the total allowable combined silt and clay content of the imported planting soil specified herein.

G. Approval of Laboratory Report: Upon approval of the Laboratory's report by the Owner's Representative, the recommendations in the report shall become a part of the Specifications and the quantities of soil amendment, fertilizer and other additives shall be adjusted to conform with the report at no additional cost to the owner. Request Testing Laboratory to send one copy of test results directly to Owner's Representative and one copy to the Owner. Note that there is a minimum quantity of organic amendment specified elsewhere in this specification section.

1.4 PROJECT/SITE CONDITIONS

A. Site Visit: At beginning of work, visit and walk the site with the Owner's Representative to clarify scope of work and understand existing project/site conditions.

1.5 WARRANTY AND REPLACEMENT

A. Pre-Emergence Weed Killer: Warrant the work against weed growth for a period of four (4) months after application.

B. Warrant all plants and planting to be in a healthy, thriving condition until the end of the maintenance period, and deciduous trees beyond that time until active growth is evident.

C. Replace all dead plants and plants not in a vigorous condition immediately as directed by the Owner's Representative at Contractor's expense. Install replacement plants before the final acceptance at the size specified.

D. Warrant all plant material for a period of one year after final acceptance of the maintenance period against plant materials with defects at the time of installation.

E. Warrant plant installation and maintenance by Contractor against defects for a period of one year.

PART 2 - PRODUCTS

2.1 PLANTS

A. Plant the variety, quantity and size indicated. The total quantity tabulated on the drawings are considered approximate and furnished for convenience only. Contractor shall perform his/her own plant quantity calculations and shall provide all plants shown on the Drawings.

B. Tag plants of the type or name indicated and in accordance with the standard practice recommended by the American Association of Nurserymen.

C. Install healthy, shapely and well rooted plants with no evidence of having been rootbound, restricted or deformed.

D. Take precautions to ensure that the plants will arrive at the site in proper condition for successful growth. Protect plants in transit from windburn and sunburn. Protect and maintain plants on site by proper storage and watering.

E. Substitutions will not be permitted, except as follows:

1. If proof is submitted to the Owner's Representative that any plant specified is not obtainable, a proposal will be considered for use of nearest equivalent size or variety with an equitable adjustment of contract price.
2. Substantiate and submit proof of plant availability in writing to the Owner's Representative within 10 days after the effective date of Notice to Proceed.

2.2 FERTILIZERS

A. Commercial fertilizer, pelleted or granular form, conform to the requirements of Chapter 7, Article 2, of the Agricultural Code of the State of California for fertilizing materials as follows:

Type A: 6% Nitrogen, 20% Phosphorus Acid and 20% Potash, (6-20-20).
Type B:21 gram planting tablets 20% Nitrogen, 10% Phosphoric Acid and 5% Potash (20-10-5) available from Agriform or 10gm BestPacks packets 20% Nitrogen, 10% Phosphoric Acid and 5% Potash (20-10-5) available from Best Fertilizer Co.
Type C: Complete fertilizer 21% Nitrogen, 7% Phosphoric Acid and 14% Potash (21-7-14).

If commercial fertilizer having this analysis is not obtainable, other similar commercial fertilizer may be used providing it meets the approval of the Owner's Representative.

B. Maintenance Fertilizer: Type C

2.3 ORGANIC AMENDMENT FOR IN SITU SOILS (ON-GRADE):

A. Ground Redwood or Ground Fir Bark with the following properties:

Percent Passing	Sieve Designation		
100	9.51 mm	3/8"	
50-60	6.35 mm	1/4"	
20-40	4.76 mm	No. 4	
0-20	2.38 mm	No. 8	8 mesh

Redwood Sawdust

1. Dry bulk density, lbs. per cu. yd., 260-280
2. Nitrogen stabilized - dry weight basis, min. 0.4%
3. Salinity (ECe): 4.0 maximum
4. Organic Content: 90% minimum
5. Reaction (pH): 4.0 minimum

Ground Fir and/or Pine Bark

1. Dry bulk density, lbs. per cu. yd., Min. 350
2. Nitrogen stabilized - dry weight basis, min. 0.5%
3. Salinity (ECe): 4.0 maximum
4. Organic Content: 90% minimum
5. Reaction (pH): 4.0 minimum

B. Submit sample along with analytical data from an approved laboratory for degree of compliance to the Owner's Representative within two weeks after award of Contract.

2.4 IRON SULFATE: Dry form.

2.5 PLANT BACKFILL: Use a mixture of 2 parts soil from the hole, and 1 part amendment with iron added at the following rates:

1 gallon can plants	-	iron, 1/4 cup
5 gallon can plants	-	iron, 1/3 cup

Mix the iron, amendment and soil thoroughly for use in the top 8 inches of backfill around plants.

2.6 MULCH

A. Organic Mulch: Fir or pine bark chips, dark in color; 3/4-inch to 1-inch.

B. Submit samples of organic mulch to the Owner's Representative for approval within two weeks of award of Contract. Resubmit until acceptable to Owner, at no extra cost.

2.7 PLANTING SOIL (TOPSOIL):

A. Planting soil is defined as on-site surface soil. Satisfactory planting soil shall be free of subsoil, clay, lumps, stones, and other objects over 4" in diameter, and without weeds, roots, and other objectionable material.

B. If herbicide contamination is suspected then a radish/ryegrass growth trial must be performed. Consult with Owner's Representative prior to decision to test or not.

PART 3 - EXECUTION

3.1 FINE GRADING AND SOIL PREPARATION

A. Planting Soil Placement:
1. Inspect planting areas and remove all base rock and other foreign material Rip all planting areas in two directions full depth of compacted fill (to a minimum of 6 inches) into undisturbed native soil prior to backfilling. Scarification of any planting area which cannot be accomplished with a tractor shall be accomplished by an alternative method approved by the Owner's Representative to the specified depth to ensure proper drainage.
2. Prior to placing planting soil secure the Owner's Representatives acceptance of the planting areas subgrade condition. After acceptance of the planting areas subgrade condition, uniformly distribute and spread planting soil backfill over scarified subgrade as specified in planting areas and compact to a maximum of 85% relative compaction.
3. Do not work planting soil in a wet or muddy condition or dump or spread in areas where subgrade is not in proper condition.
4. Water settling, puddling, and jetting of fill and backfill materials as a compaction method is not acceptable.
5. Provide a minimum of ___6 inches_____ depth in planting areas.

B. Planting Soil Placement in Planting Islands and Adjacent to Pavement Areas: Provide planting soil as a final lift in all planting areas within and adjacent to paved areas and other construction where native site soil has been covered by engineered fill and/or base rock. Remove all engineered fill, base rock and compacted subgrade full depth of compaction and replace with approved planting soil, a minimum lift of ___12 inches_____.

3.2 SHRUB PLANTING

A. Mark shrub locations on site using stakes, gypsum or similar approved means and secure location approval by the Owner's Representative before plant holes are dug. Adjust location as necessary prior to planting.

B. Test drainage of plant beds and pits by filling with water (minimum 6"). The retention of water in planting beds and plant pits for more than two (2) hours shall be brought to the attention of the Owner's Representative. If rock, underground construction work, tree roots, poor drainage, or other obstructions are encountered in the

excavation of plant pits, alternate locations may be selected by Owner's Representative.

C. Excavate tree, shrub and vine pits as follows:

Excavation for	Width	Depth
Canned Shrubs/Vines (1 or 5 gc)	Can + 12"	Can + 12"

D. Break and loosen the sides and bottom of the pit to ensure root penetration and water test hole for drainage as required above.

E. Backfill plant holes with mix as specified, free from rocks, clods or lumpy material. Backfill native soil free of soil amendments under rootball and foot tamp to prevent settlement. Backfill remainder of the hole with soil mix and place plant tablets or packets (Type B fertilizer) 3 inches below finish grade and 1/2-inch from roots at the following rates:

1 gallon can plant	-	1 tablet or packet
5 gallon can plant	-	3 tablets or packet

F. Carefully remove and set plants without damaging the rootball. Superficially cut edge roots vertically on three sides. Remove bottom of plant boxes before planting.

G. Set plants in backfill with top of the rootball 2 inches above finished grade. Backfill remainder of hole and soak thoroughly by jetting with a hose and pipe section. Water backfill until saturated the full depth of the hole.

H. Build 6" high watering basin berms around shrubs to drain through rootball.

I. Remove any soil from top of plant rootballs and secure Owner's Representative's approval of rootball height prior to mulching.

J. After approval of rootball height, install as required below.

3.3 MULCH:

A. Mulch all shrub areas with organic mulch to a 3-inch depth, except adjacent to walkways where soil grade is 2 inches below top of pavement, mulch shall be 2 inches deep.. Hold bark mulch away from base (trunk) of plant 4" or as directed by the Owner's Representative

3.4 PRE-EMERGENCE WEED KILLER: Apply pre-emergence weed killer in all areas to receive ground cover planting. Work shall be done under the supervision of a person licensed by the State of California as a pest control applicator and holding a qualified applicator license or a Qualified Applicator Certificate. Obtain approval of the finish grades prior to applying weed killer and coordinate planting and watering with the pest control specialist prior to planting. Take care to keep weed killer off areas to be seeded.

3.5 WATERING: Water all trees, shrubs and ground cover immediately after planting. Apply water to all plants as often and in sufficient amount as conditions may require to keep the plants in a healthy vigorous growing condition until completion of the Contract. Do supplemental hand watering of shrubs during the first 3 weeks of plant establishment.

3.6 MAINTENANCE OF PLANTING: Maintain plants from time of delivery to site until final acceptance of landscape installation.

3.7 PRE-MAINTENANCE PERIOD REVIEW AND APPROVAL OF PLANTING

A. Receive approval of the installed planting prior to commencement of planting establishment maintenance period. Notify the Owner's Representative a minimum of seven (7) days prior to requested review. Before the review, complete the following:

1. Complete all construction work.
2. Present all planted areas neat and clean with all weeds removed and all plants installed and appearing healthy.
3. No partial approvals will be given.

3.8 PLANTING ESTABLISHMENT MAINTENANCE

A. General Requirements:

1. Maintenance Period: The planting establishment maintenance period required shall be 120 calendar days after all planting is complete and installation approved. A longer period may be required if the turf or groundcover is not thick and vigorous, or if the plant material is not acceptably maintained during the maintenance period. The maintenance period may be suspended at any time upon written notice to the Contractor that the landscaping is not being acceptably maintained, and the day count suspended until the landscape is brought up to acceptable standards as determined by the Owner's Representative.

2. Planting establishment maintenance immediately follows, coincides with, and is continuous with the planting operations, and continues through turf or groundcover installation, and after all planting is complete and accepted; or longer where necessary to establish acceptable stands of thriving plants.

3. Protect all areas against damage, including erosion, trespass, insects, rodents, disease, etc. and provide proper safeguards. Maintain and keep all temporary barriers erected to prevent trespass.

4. Keep all walks and paved areas clean. Keep the site clear of debris resulting from landscape work or maintenance.

5. Repair all damaged planted areas, and replace plants immediately upon discovery of damage or loss.

6. Check irrigation systems at each watering; adjust coverage and clean heads immediately. Adjust timing of controller to prevent flooding.

7. Maintain adequate moisture depth in soil to ensure vigorous growth. Check rootball of shrubs and plants independent of surrounding soils and hand water as required.

8. Keep Contract areas free from weeds by cultivating, hoeing or hand pulling. Use of chemical weed killers will not relieve the Contractor of the responsibility of keeping areas free of weeds over 1-inch high at all times.

B. Plant and Shrub Maintenance:

1. Maintain during the entire establishment period by regular watering, cultivating, weeding, repair of stakes and ties, and spraying for insect pests. Prune when requested by the Owner's Representative.

2. Keep watering basins in good condition and weed-free at all times.

3. Replace all damaged, unhealthy or dead shrubs with new stock immediately; size as indicated on the drawings.

C. Fertilizing:

1. Upon approval and after submitting fertilizer delivery tags, maintenance fertilization shall begin 30 days after planting is complete Reapply every thirty (30) days until acceptable.

2. Early spring and fall substitute a complete fertilizer such as 15-15-15 applied at the rate of 6 lbs. per 1,000 square feet, to help insure continuing adequate phosphorus and potassium.

3. Observe plant's color, and if a soil pH imbalance is suspected, take soil samples and obtain laboratory analysis for confirmation. Take necessary action recommended in laboratory analysis such as top dressing with soil sulfur, leaching soil, etc.

3.23 FINAL PLANTING REVIEW AND ACCEPTANCE

A. At the conclusion of the Maintenance Period, schedule a final review with the Owner, the Owner's maintenance person, and the Owner's Representative. On such date, all project improvements and all corrective work shall have been completed. If all project improvements and corrective work are not completed, continue the planting establishment, at no additional cost to the Owner, until all work has been completed. This condition will be waived by the Owner under such circumstances wherein the Owner has granted an extension of time to permit the completion of a particular portion of the work beyond the time of completion set forth in the Agreement.

B. Submit written notice requesting review at least 10 days before the anticipated review.

C. Prior to review, weed and rake all planted areas, repair plant basins clear the site of all debris and present in a neat, orderly manner.

*** END OF SECTION ***